

TWO CASES OF ANOMALOUS SPINOUS PROCESS
OF SEVENTH CERVICAL VERTEBRA ARTICU-
LATING WITH THE SCAPULA.¹

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WITHIN a period of two weeks two patients were brought to the Orthopædic Department of the Jefferson Medical College Hospital, with conditions about the same.

The first patient was sent by Dr. W. F. Morrison, of this city, to determine what could be done for her shoulder, which was supposed to have been injured at birth. The child was seven years of age, of very slender build, and enjoyed excellent health. The history of perfectly normal birth was obtained, also that the condition was noticed soon after she was born and was thought to be a pressure paralysis occasioned in some way at the time of delivery.

Her general appearance was that of one affected with torticollis. The head seemed markedly drawn to the left side, and attempted movement to the right showed the cervical muscles on the left side to be much shortened and quite tense. (Fig. 1.) After being stripped, the seeming lateral turning of the head was found to depend upon the elevation of the shoulder (Fig. 2), and this in turn was readily observed to be firmly ankylosed to the spine. The spare condition of the child favored a very satisfactory examination, and permitted the outlining of all the spinous processes excepting that of the first dorsal.

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Movement at the scapulo-humeral joint was free and normal in all directions. When, however, both hands were put forward, the left was found about one and one-half inches shorter than the right;



FIG. 1.—Case I.

also there was noted inability to stretch the arm directly upward (Figs. 3 and 4) when these movements were attempted; the scapula was seen to move about a point at its posterior superior angle as a

centre, and could not be raised and lowered, moved forward or backward, or rotated as could the other one. The diagnosis of "anchoring of the scapula to the spine" was then made, and the case held under advisement.



FIG. 2.—Case I.

In two weeks the second case, a patient of Dr. L. E. Taubel, of this city, presented herself and was operated upon, as detailed later, and the uniformly good results obtained indicated a similar procedure

in the younger girl. The X-ray was used prior to operation, but for some undetermined reason a satisfactory negative was not obtained. The operation was performed on July 13, 1899, by Dr. Rugh, assisted by Dr. H. M. Righter and Dr. T. H. McGhee. The incision was



FIG. 3.—Case I.

made directly over the vertebro-scapular articulation, and the interposed bone readily exposed. The scapular end was first separated, the bone seized with strong forceps and cut off about one and one-half inches higher up. The scapula was then found freely movable.

The wound was dried and closed without drainage, and a large wedge-shaped pad, base upwards, placed in the axilla and the arm firmly bandaged to the side. Union by first intention occurred, and free gymnastic exercises were given to increase the mobility of the

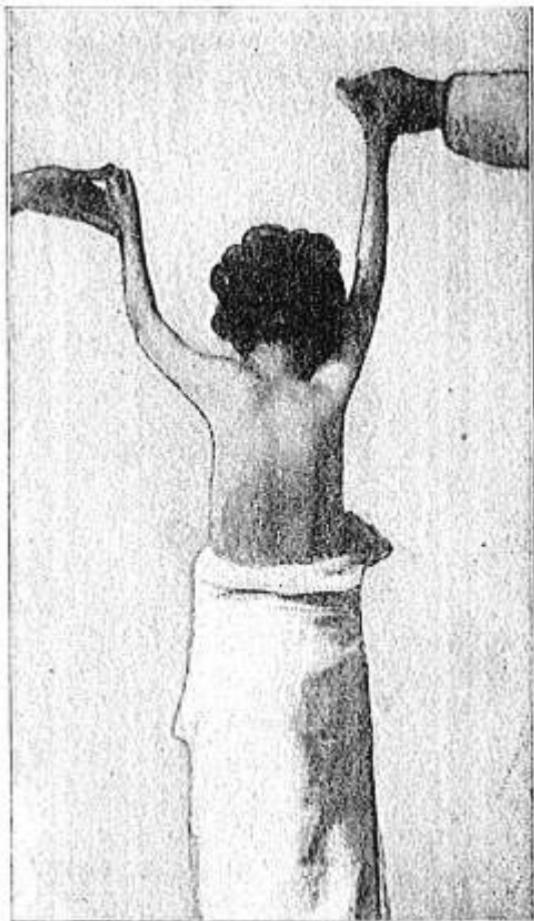


FIG. 4.—Case I.

scapula. No pain or other unpleasant symptoms have followed the operation; the two shoulders are now the same length, and there is every reason to believe that when she has attained her growth there will be present no trace of her former condition.

The elder girl, aged sixteen, when seen by Dr. Wilson, who had not seen the first case, complained of limitation of motion of left shoulder, stating that the left shoulder blade was higher than the right, and had always been so.



FIG. 5.—Case II.

The statements were so similar to those made by patients with rotary-lateral curvature, except as to duration, that no further inquiry was made at that time, and inspection was made at once with the

shoulders and trunk bare above the waist. While standing at ease the left shoulder and scapula occupied a conspicuously higher position than normal, as shown in Fig. 5. With the index and next fingers placed upon either side of the spinous processes, the prominent process of the seventh cervical vertebra was taken as a starting-point to observe any deviation of the spinal column. At once there was observed to be some apparent irregularity, for instead of the usual ease of following the spines of the dorsal vertebrae, something seemed to divert the fingers to the left, which at first appeared to be a divergence of the entire spinal column.

This divergence appeared to be slight bending of the cervical and dorsal vertebrae, with the convexity to the left and with a very considerable amount of rotation, throwing the spinous processes in the line of the conspicuous irregularity above referred to. In bending forward to the extreme limit, the spinal column appeared to arch forward normally, and each of the methods usually resorted to for determination of rotary-lateral curvature demonstrated absence of that deformity.

Attention was now directed to the movements of the shoulders, and the patient was directed to raise both arms from the sides to above the head. In attempting this movement, as the arms reached a point of extension at the sides on a level with the shoulders, it was found that the left shoulder was markedly elevated and occupied a position nearer to the spinal column than the right. (Fig. 6.) The left arm could be raised high above the shoulders when the head was thrown to the right side, for which there was then no apparent explanation, but which, in the light of subsequent events, was clearly due to the ossific connection between the scapula and cervical vertebra.

The left shoulder was not only higher than the right, but was also nearer to the spinal column by one-half inch, which condition was associated with a marked increase in the curves of the left scapula.

Recourse was now had to the X-ray for information as to the condition of the bones, which could not be definitely ascertained by manual manipulative methods. The patient was placed upon her back upon a board table, and the Crooks tube placed directly over the median line of the neck at a height of twelve inches, and Mr. L. H. Prince obtained the photograph (Fig. 7). This showed the presence of an unnatural substance, having about the same density as the ribs in the same subject, and occupying an oblique position, which in

the photograph appeared to start from the cervical vertebræ somewhere below the skull and to extend to the left scapula. The spinal column was shown to be curved with concavity to the left, which is



FIG. 6.—Case II.

not in accord with cases of rotary-lateral curvature where the left scapula is higher. This observation entirely disproved the impressions gained by the previous manual examination. A second X-ray was taken with the patient in the same position as in the first, the Crooks

tube, however, being placed about eight inches to the left of the median line of the neck, and the resulting photograph (Fig. 8) is shown, confirming in every respect the conditions found in the first one.

It was now apparent that further and definite information could only be obtained by an exploratory incision, at which time this apparently supernumerary bone could be excised, if practicable. The conditions being explained to the patient and her family, and their full consent being obtained, the patient, on June 15, 1899, was etherized by Dr. H. M. Righter and operated upon by Dr. Wilson, assisted by Dr. Rugh. An incision was made in a line with the supernumerary bone, which was found to be placed superficially, having only a few muscular fibres between it and the skin. As soon as the bone was isolated throughout its length, its fibrous connection with the scapula was severed, and it was found that its upper end was firmly attached to the spinal column, for any motion in manipulation caused a corresponding motion of the head. The upper end was found to have an osseous union with the seventh cervical vertebra, and it was cut by bone forceps quite close thereto. There was no other spinous process for the seventh cervical vertebra. The wound was closed and the patient made an uninterrupted recovery.

The patient was drilled in a few gymnastic movements, which resulted in increased freedom of motion, and very little evidence of the former disability now remains. This patient was at various times taken to several hospitals in this city, but apparently without a correct diagnosis having been made, which is easily accounted for, inasmuch as she was subjected to the X-rays for the first time after she came to the Jefferson Hospital.

Prior to the time of the operation upon the elder girl, and with the X-ray pictures in hand, she was seen at our request by Dr. Harry M. Sherman, of San Francisco, Dr. J. Chalmers Da Costa, Dr. W. J. Hearn and many others, but no positive explanation of this growth was obtained, other than that it was a congenital anomaly of unique form. Dr. Sherman thought it might be an ossified rhomboid muscle; Drs. Da Costa, Hearn, and Wilson were non-committal; while Dr. Rugh, who alone had the advantage of carefully studying the case of the younger girl, believed that an elongated spinous process caused the condition present in both cases.

The bone removed from the elder girl (Fig. 9) was two inches long and one and three-quarters inches in circumference, being firmly attached at its spinal end by bony union, yet showing signs of having



FIG. 7.—Skiagraph showing patient in the directly antero-posterior position.



FIG. 8.—Skin graph obliquely from left front, patient on back.

had other form of attachment in early life. At the scapular end there was a well-rounded articulating surface where it was in contact with the edge of the scapula. The bone is in shape, size, and general appearance an enlarged spinous process, having a very dense outer layer and reticulated inner part, and tapering from the base to the apex. It is not so flat as a rib, and shows no evidence of a groove on its under surface.

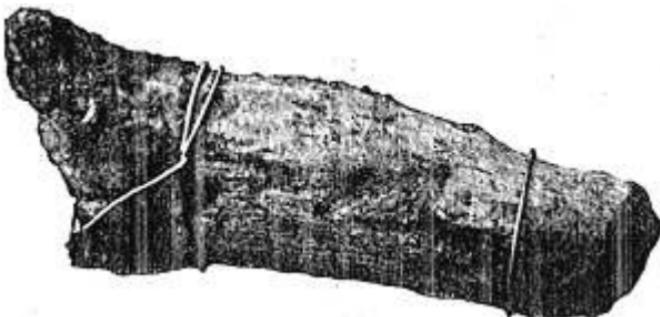


FIG. 9.

The bone removed from the younger girl (Fig. 10) was one and a quarter inches long and one and an eighth inches in circumference. At the spinal end there appears two small tuberosities, which, together with the space between them, were covered with articular cartilage, as was also the scapular end. These tuberosities gave the specimen the

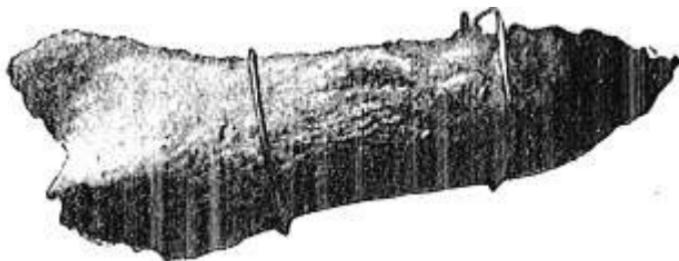


FIG. 10.

appearance of a spinous process, they being the parts which have attachment with the laminae of the arch.

Francis L. Parker, in "Observations on Some Osteological Anomalies of the Vertebral Column" (*American Journal of the Medical Sciences*, 1869, n. s., lviii, p. 93), says that "unless associ-

ated with some variety of cranial deficiency, the cervical region is less involved than any of the others."

In searching for an explanation of these unique cases, no similar cases could be found in English, French, or German literature, the nearest approach thereto being found in what is termed cervical ribs.

John Struthers, in his paper "On Variations of the Vertebrae and Ribs in Man" (*Journal of Anatomy and Physiology*, London, 1874, ix, p. 17), says: "It is, however, common among quadrupeds to have the first rib articulating with the seventh cervical vertebra as well as with the first dorsal." He describes eleven specimens of cervical ribs attached to cervical vertebrae found in his dissecting-room in the University of Aberdeen. Nothing to correspond with these two cases now reported were referred to, and we believe them to be unique.

The characteristics of both specimens render justifiable the theory that there has been an extra centre of ossification for a spinous process, and this has been pushed or placed beyond the normal centre for the process of the seventh cervical vertebra, though this does not account for the fact that in both cases there was firm articulation with the scapula.